

portion of the sky, as it was from this quarter that the display was expected.

It may also be mentioned that as both observers were on the Eastern terrace, a considerable portion of the western sky was hid from their view.

On the Meteoric Shower of 1866, November 13-14.

By the Rev. W. R. Dawes.

The glorious display of the November meteors was seen to great advantage from this station during the night of the 13th, the sky, after a rainy day, having almost entirely cleared by about 8^h. A few meteors were seen in the evening; but no regular watch was commenced till about 11^h. I had two assistants; and, as feeble health forbade my being exposed to the keen W. by N. wind (which formed the only drawback to the pleasure of the exhibition), I took my station with one assistant on the east side of my house, having a good view of nearly the whole of the eastern hemisphere. My other assistant, who was also unable to face the cold blast, I stationed at an upper west window of the house. The only clouds were a few near the northern horizon, and a bank along the western horizon scarcely higher than from 5° to 7°.

At first I intended to note the G.M.T. of the appearance of the most remarkable meteors, and the course each pursued among the stars, with their relative brightness, colour, &c.; and for some time I accomplished this, and will here state the particulars of some of the brightest.

Remarks.

G.M.T.				
h	m	s		
11	22	0 ±		A little south of <i>Rigel</i> ; course due west; long bright train; extinguished at an altitude of 25°; pinkish; brighter than <i>Mars</i> or <i>Sirius</i> ; nearly as bright as <i>Venus</i> at her maximum.
11	26	0 ±		From <i>Pollux</i> , through <i>Aldebaran</i> , and about 20° beyond; decidedly of a greenish hue.
11	45	10		From <i>Mars</i> over the zenith; as bright as <i>Venus</i> at maximum; leaving a long and bright train.
11	47	0 ±		Very bright; through α <i>Androm</i> . Up to midnight 75 meteors were counted in the eastern hemisphere.
12	6	30		From a little south of <i>Procyon</i> to 15° above <i>Sirius</i> . As bright as <i>Venus</i> at maximum.
12	21	15		Through α <i>Orionis</i> ; as bright as <i>Jupiter</i> .
12	22	40		Shot a little north of <i>Mars</i> ; brighter than <i>Mars</i> .
12	32	0 ±		Bright; from β <i>Canis Min.</i> ; through the nebula of <i>Orion</i> .

At this time the meteors became so numerous that while noting down the particulars of one I lost sight of ten or more. I therefore gave it up, and determined to note the instant when each succeeding hundred were counted in the eastern hemisphere, and will here set down the numbers counted after midnight.

G.M.T.	No.	G.M.T.	No.	G.M.T.	No.
h m s		h m s		h m s	
12 18 28	100	13 3 47	1100	13 22 40	2000
12 30 0	200	13 5 43	1200	13 25 33	2100
12 36 30	300	13 7 33	1300	13 28 50	2200
12 42 25	400	13 9 33	1400	13 33 0 \pm	2300
12 47 15	500	13 11 30	1500	13 38 10	2400
12 50 28	600	13 13 20	1600	13 43 37	2500
12 54 0	700	13 15 35	1700	13 50 50	2600
12 56 55	800	13 18 3	1800	14 0 15	2700
12 59 50	900	13 20 0 \pm	1900	14 13 10	2800
13 1 4	1000				

At 14^h 3^m 35^s, a rather bright one passed exactly through *Castor*.

Towards the west nearly 400 were counted before 13^h 15^m; about which time they became so numerous (6 or 8 being visible almost simultaneously), that my assistant stationed there became bewildered and "lost count;" not having been provided with the means of noting down the number. It appears, therefore, that about 3300 were *counted*, and from what I saw during an occasional peep into the western hemisphere, I conclude that more than 3500 were seen; beside many which must have escaped observation.

I attempted to trace backward several of the most remarkable meteors to the radiant point; and concluded that it lay decidedly to the N.W. of γ *Leonis*. It was certainly not identical with that star, but seemed to lie in a line from *Regulus* towards μ *Leonis*, and about twice as far from *Regulus* as from μ . More exactly than this I failed to determine it.

Two remarkable individuals were observed, which may be worthy of special notice, though at the time the numbers were so great that the time of appearance was not noted. This I regret, as it would have been interesting to ascertain whether the same were noticed elsewhere. About 13^h 30^m a pretty large meteor, about the size of *Mars*, passed from near *Procyon* a little above α and γ *Orionis*. Its motion was much slower than that of most others; it was perfectly round, and its colour was that of rather dull red-hot iron. It looked like a large red-hot shot at a great distance. Its brightness gradually faded after it had passed *Orion*, and it quite disappeared at about 25° west of γ *Orionis*, but without any appearance

of combustion ; and it left no train behind. I called the attention of my assistant to it, who saw it exactly as I did.

The other was very bright, arriving at its maximum at about 45° from the zenith towards the west, where it seemed to be suddenly extinguished, leaving a long and brilliant train. But in a second or two afterwards it again lighted up, though with an inferior degree of brightness, and passed on rapidly behind the bank of clouds near the western horizon.

Several near the radiant point in *Leo* appeared like a little puff of steam, and assumed a form like a shuttle, which forcibly reminded me of the great nebula in *Andromeda*, as seen with small optical power. These usually remained nearly stationary, though some seemed to twirl round through 20° or 30° while disappearing.

The peculiar meteor described by the Rev. R. Main in a notice in *The Times* as seeming to cling to ζ *Orionis*, and then pass on westward, was seen here almost exactly as he described it. It remained so long visible, and looked so much like a nebula or faint comet, that but for its gradual loss of light it might have been easily mistaken for such an object.

Several faint flashes of light were seen ; and I doubted at the time whether they were really very faint sheet lightning, or the reflection of remarkably bright meteors which were out of sight.

Only two or three were observed to take a course contrary to the rest. One of these, very bright, darted down behind the eastern horizon.

Grand as was the display, there was not a single meteor which would bear comparison with several which I saw at Ormskirk on the 12th of November, 1832 ; on which occasion, notwithstanding a pretty bright moon, three or four cast a very dark shadow of my Observatory towards the side on which the moon was shining. A very thick fog suddenly arose at about $13\frac{1}{2}^h$: but several of the country folk going early with agricultural produce to Liverpool said, that "though there was a terribly thick fog, yet *it lightened all the way*." So that probably many brilliant specimens darted across till near sunrise. Of that splendid display I have never met with a good and particular description. It was the first I had witnessed, and I have never since seen anything like it with respect to the brilliancy of many of the meteors, which, though not quite so large, yet gave as much light as the full moon.

Hopefield Observatory, Haddenham, Bucks,
1866, Dec. 11.